4·))·3A

Interface **G**enius **M**odem
Instruction Manual
v1.2.4

Interface Genius Modem is a USB / LAN controlled SO2R radio interface remote radio modem. It is designed to be controlled by a Windows application, and can be used stand alone as well.

FRONT PANEL OVERVIEW

IG-M Front Panel

MENU KEYBOARD
IG-M is designed to be easy to use and most settings can be done without the need for a computer, using the MENU KEYBOARD on the front panel.
Besides settings, the keyboard can be used for SO2R mode and switching between SO2R and MODEM mode.

LED PANEL
The LED PANEL intuitively displays headphone audio distribution in SO2R mode, as well as PTT for both radios.

CW POT
The CW POT is used to change the CW speed of the built in CW keyer. IGM uses the latest generation WinKey V3.0. More on this in the CW section.

RX A and RX B POT
Used for setting the audio levels recorded from radio A and radio B.

PHONO CONNECTOR
Used for connecting the operators headphones.

MIC CONNECTOR
Used for connecting the operators microphone.

REAR PANEL OVERVIEW

IG-M Rear Panel

CAT CONNECTOR
For connecting the CAT from the radio. If you have a 6000 Series FlexRadio this jack will be unused, and it will use the LAN connection from the USB panel program.

USB2 CONNECTOR
For firmware upgrades.

LAN CONNECTOR
For the LAN network, standard Ethernet cable.

PTT OUT
PTT OUT1 and PTT OUT2 are PTT outputs with no delay. Using jumpers inside the device, you can configure the outputs to be GND or +12VDC, with maximum current of 2A.

PTT DLY
PTT DLY1 and PTT DLY2 are PTT outputs with programmable delay. Can be configured to output GND or +12VDC with jumpers as well, and also have the maximum current of 2A.

FSK CONNECTORS
For connecting foot switches for radio A and B.

PTT IN CONNECTORS
Inputs for radio A and radio B PTT signals.

PADDLE
Connector for pedal for the built in WinKey.

USB1 CONNECTOR
For connecting the PC and communication with the Panel application.

MIC REAR
Another connector for the microphone. If this connector is used the front microphone connector is disabled.

RIG PHONE
Connector for audio from the Phone output of the radio station.

REC IN
Stereo connector for recording. Used to connect AF OUT from the radio or an audio channel from radio A and audio channel from radio B if in SO2R mode.

TO RIG MIC
Connector for radio microphone.

RADIO 2 EXTENDER
Connector for the SO2R extender.

CI-V
CIV / CI 5-Communications Interface for iCOM stations.

SO2R EXTENDER

SO2R Extender

RADIO 2 EXTENDER
15 pin connector for the radio.

FSK CONNECTORS
FSK out connector.

PTT DELAY
PTT DLY1 and PTT DLY2 are PTT outputs with programmable delay. Can be configured to output GND or +12VDC with jumpers as well, and also have the maximum current of 2A.

PTT OUT
PTT OUT1 and PTT OUT2 are PTT outputs with no delay. Using jumpers inside the device, you can configure the outputs to be GND or +12VDC, with maximum current of 2A.

MIC CONNECTOR
Used for connecting the operators microphone.

AF
Audio output.

CAT
For connecting the CAT from the radio. If you have a 6000 Series Flex Radio this jack will be unused, and it will use the LAN connection from the USB panel program.

CI-V
CIV / CI 5-Communications Interface for ICOM stations.

ON DEVICE MENU
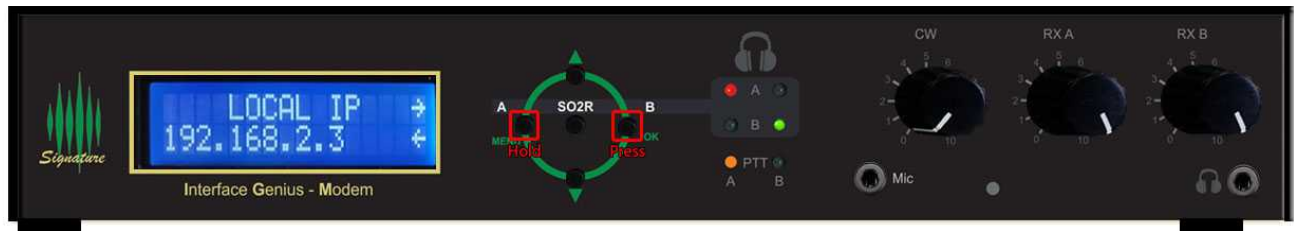
Entering the menu

To enter the menu, hold the MENU button and press the OK button. Use the UP and DOWN arrows to navigate trough items. Press OK to edit the selected item in the menu. When editing an item, use UP and DOWN arrows to edit.

Here is an overview of the options on the current firmware version:

ITEM	DESCRIPTION
LOCAL IP	The IP address of the device, needs to be set in compliance to your local network.
NETMASK	Network mask of the device, needs to be set in compliance to your local network.
REMOTE IP	The IP address of the other IGM for use in SO2R mode.
UDP PORT	The broadcast port, recommended to be set on the default value of 8000.
TCP PORT	Port used by the Windows application, recommended to be set on the default value of 8001.
IFACE MODE	Device operation mode. Can be set as: - MODEM for modem mode. - SINGLE for single mode. - SINGLE/AS for single mode with audio sharing. - DIRECT SO2R for direct SO2R. - SO2R R1 for SO2R as Radio 1. - SO2R R2 for SO2R as Radio 2.
PTT DELAY	A delay to the PTT signal, configure as necessary for your rig.
RIG1	RIG1 CAT protocol format. Currently supported radios are: - FTDX3000, FTDX5000, FTDX900, FT2000 - IC-7000 - FT-1000MP - ELECRAFT K3 - IC-775 - IC-7800
RIG2	CAT protocol format for the SO2R extender when used. If using two separate IG-M for SO2R instead of an extender there is no need to set this up.
CAT1 SERIAL	CAT configuration for RIG1.
CAT2 SERIAL	CAT configuration for the SO2R extender, when used If using two separate IG-M for SO2R instead of an extender there is no need to set this up.

WINDOWS PANEL APPLICATION

Download the latest Panel application from the Support section of www.4o3a.com Run the setup and install the Panel.
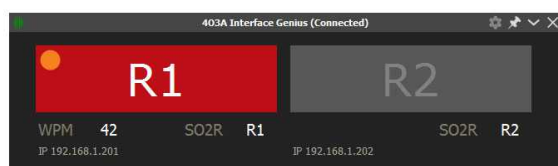

Connect Menu

After you install the Panel, connect the device to your computer via USB.
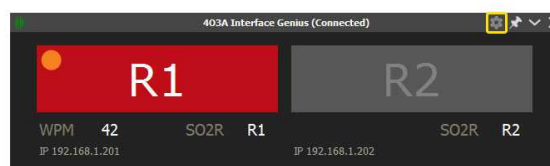

Selecting the COM port

Select the COM port from the drop down menu and click "Connect to Interface Genius".
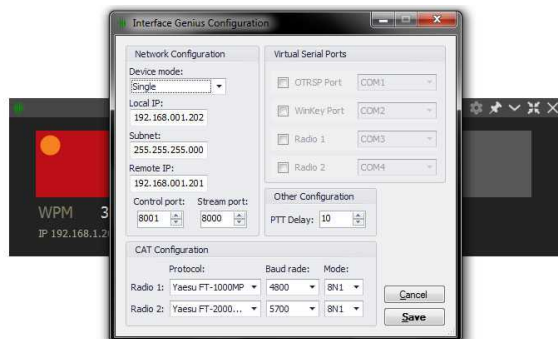Baud rate is the speed of the USB connection and should be left as is.


Working Mode

This is how the Panel looks in working mode after a successful connect.

Configuration Button

Before actually using the device you need to check its configuration. Do this by clicking the Configuration button.

Configuration Panel

In the Configuration Panel you can easily set IP settings, PTT Delay and Virtual Serial Ports.
More on IP settings and Device Modes in the **Network Configuration** section below.
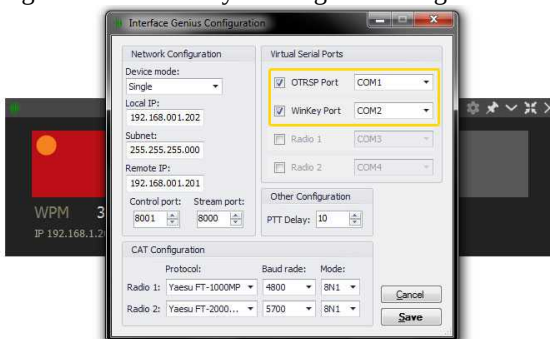

Adding the Virtual COM Ports

OTRSP Port is the Open To Radio Switching Protocol. It is designed to be used with logging software such as WinTest, N1MM, DXLog and others. Select an arbitrary COM Port number to create the virtual port.
WinKey Port is a virtual port for the WinKey.
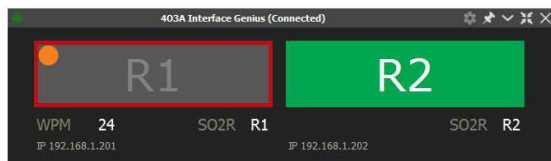Radio 1 is data sent from Radio 1.
Radio 2 is data sent from Radio 2.
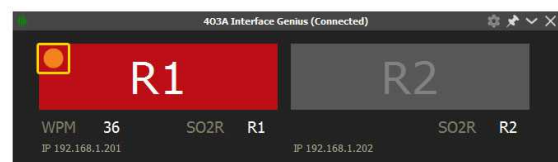
TX focus

The orange circle is an indication of TX focus.
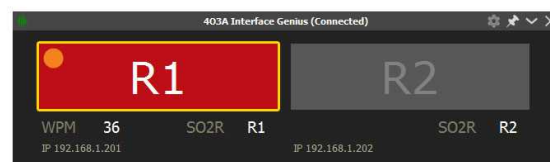
RX focus

The red square is an indication of RX received in headphones.

Working Mode Transmitting

When transmitting, transmitting radio will be marked with the red outline.
Radio you are listening in your headphones will be fully colored.
Radio 1 is always red and Radio 2 is always green.
On the picture above, we are transmitting on Radio 1 and listening Radio 2 in both headphones – left and right channel.
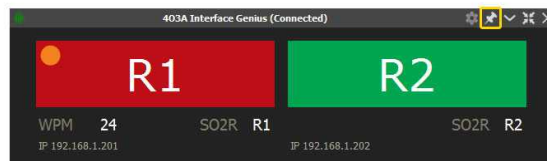
Always on top button

You can make the window "Always on top" by pressing this icon in order to prevent it from being minimized.
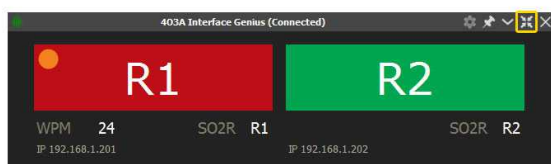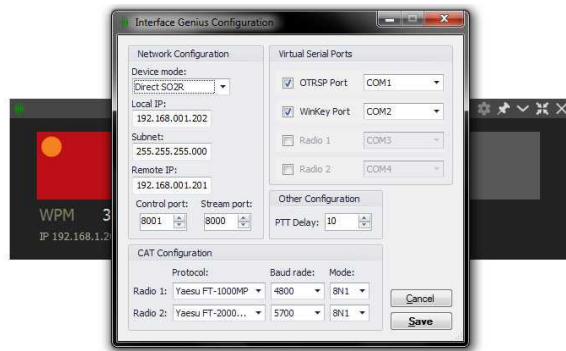

Shrink window button

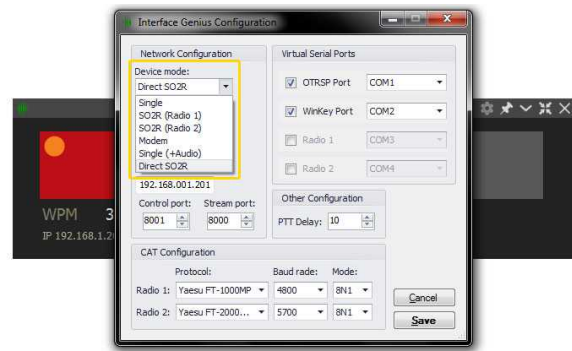You can also make the window smaller if you have many gadgets.

A shrunk window

This is how a shrunk window looks like. You will loose no information.

NETWORK CONFIGURATION

Configuration Panel

Device Mode selection

Option	Description
Local IP	The IP address of the device, needs to be set in compliance to your local network.
Sub net	Network mask of the device, needs to be set in compliance to your local network.
Remote IP	The IP address of the other IG-M for use in SO2R mode.
Stream port	The broadcast port, recommended to be set on the default value of 8000.
Control port	Port used by the Windows application, recommended to be set on the default value of 8001.
Radio 1	Radio 1 COM port settings – radio type, baud rate and mode.
Radio 2	Radio 2 COM port settings – radio type, baud rate and mode.

Network Options

Device Mode	Description
Single	IGM being used as a single device.
SO2R (Radio 1)	SO2R in network mode, IGM being set up as Radio 1.
SO2R (Radio 2)	SO2R in network mode, IGM being set up as Radio 2.
Modem	IGM being set up for remote control of the connected radio over the internet or LAN.
Single (+Audio)	IGM being used as a single device with audio sharing, allowing all IGM in network to listen to its audio on the left channel.
Direct SO2R	SO2R mode with the SO2R extender box. No LAN needed.

Device mode

MODES OF OPERATION OVERVIEW

SO2R has two modes of operation:
- **Direct Mode**, using IGM in combination with our SO2R extender box.
- **Network** Mode, using two IGM over the LAN network.

SINGLE has two modes of operation:
- **Single**, when used stand alone
- **Single with audio sharing**, broadcasting your audio stream to other IGM devices for monitoring or listening.

MODEM mode is used to control your IGM by a Windows application over your LAN network or remotely over the internet.

SO2R DIRECT MODE

SO2R Direct mode

On the left side, the IGM is connected to the radio. On the right side, the 4O3A SO2R Extender box is connected to the second radio. To connect IGM and SO2R Extender we use the 9 + 3 pin VGA cable.
This is the standard SO2R configuration used today. SO2R Extender is cheaper then another IGM device, but it requires rewiring of your station for different kinds of contests, such as Multi OP.

To configure your IGM, you can use the on device menu, or the Panel Software.
In order to set the COM ports trough the menu, hold <MENU> and <OK> buttons on the device for more then a second. In the menu, find and set the following items:

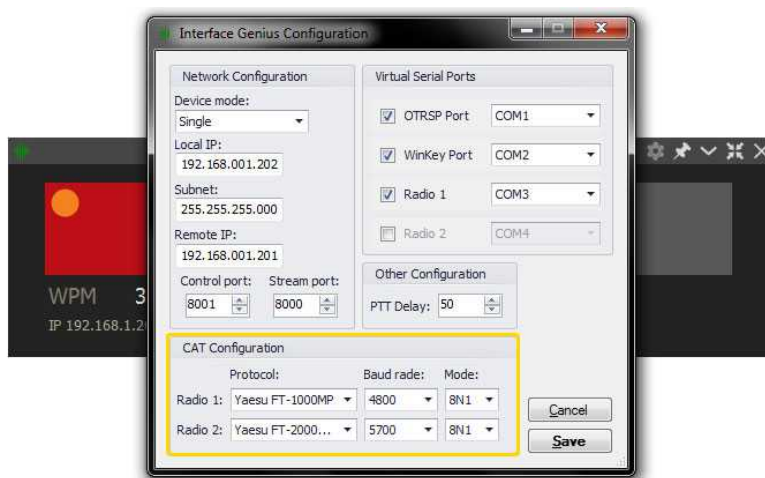*Your radio under RIG1*

Your radio under RIG2

CAT1 speed and settings

CAT2 speed and settings

You can also use the Panel software to set the same COM port settings instead:


CAT settings

After you connect your radio, frequency will be display on the main display.
A ***** symbol will let you know that IGM is communicating with the radio directly. After successfully setting up your logging software, this symbol will disappear letting you the logging software is communicating with the radio over the virtual COM port.
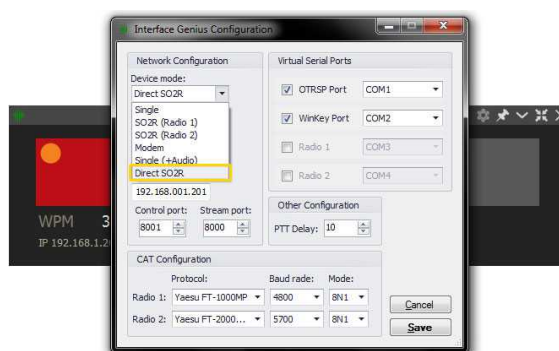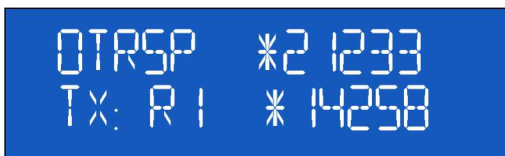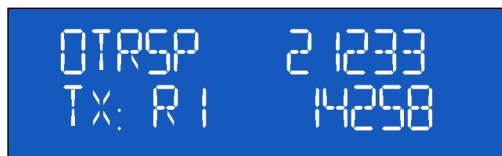

IGM communicating with the Radio directly
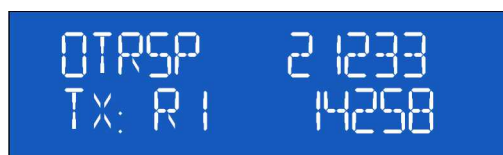
Logging software communicating with the Radio over virtual COM

Then, you can select your mode in two ways:

From the device menu

From Panel

Lastly, you will need to create virtual ports in the Panel software:
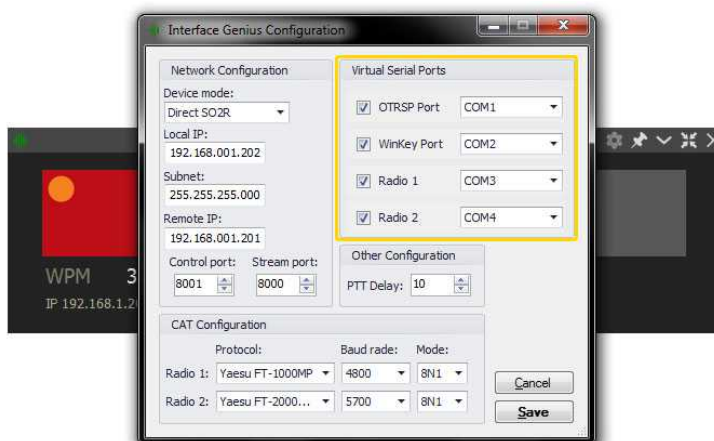
Virtual COM Ports

SO2R NETWORK MODE

SO2R Network mode

Using two spearate IG-M as radio interfaces connected over the TCP/IP network. This is the 4O3A way. It allows for maximum station power and flexibility, making Multi OP reconfiguration as easy as a click of a button.

To configure your IGM, hold <MENU> and <OK> buttons on the device for more then a second. In the menu, find and set the following items:

RIG1 Settings

Your radio under RIG1.

CAT1 speed and settings.

After you connect your radio, frequency will be display on the main display.

A ***** symbol will let you know that IGM is communicating with the radio directly. After successfully setting up your logging software, this symbol will disappear letting you the logging software is communicating with the radio over the virtual COM port.

| OTRSP   *2 1233 | OTRSP   2 1233 |
| Tx: R1   * 14258 | Tx: R1   14258 |

IGM communicating with the Radio directly   *Logging software communicating with the Radio over virtual COM*

| LOCAL IP   -- | NETMASK   -- |
| 192. 168. 1.201 -- | 255.255.255.0   -- |

IP Address of your device   *Mask of your network*
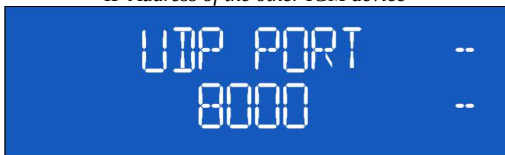
| REMOTE IP   -- | TCP PORT   -- |
| 192. 168. 1.202 -- | 8001   -- |

IP Address of the other IGM device   *TCP Port for the Panel application should be left as default*

| UDP PORT   -- |
| 8000   -- |

Broadcast port for your device should be left as default.

RIG2 Settings

| RIG1   -- | CAT1 SERIAL   -- |
| FTDx3000   -- | 4800/8N1   -- |

Your radio under RIG1.   *CAT1 speed and settings.*

| LOCAL IP   -- | NETMASK   -- |
| 192. 168. 1.202 -- | 255.255.255.0   -- |

IP Address of your device   *Mask of your network*

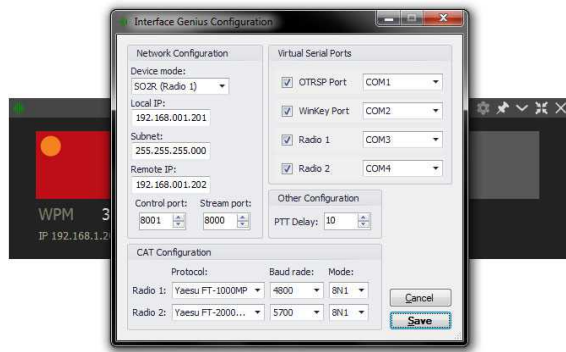| REMOTE IP   -- | TCP PORT   -- |
| 192. 168. 1.201 -- | 8001   -- |

IP Address of the other IGM device   *TCP Port for the Panel application should be left as default*
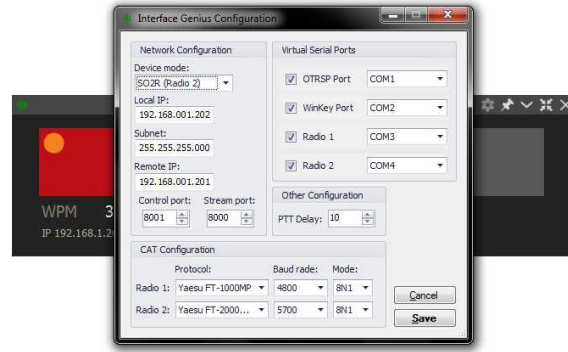
Broadcast port for your device should be left as default.

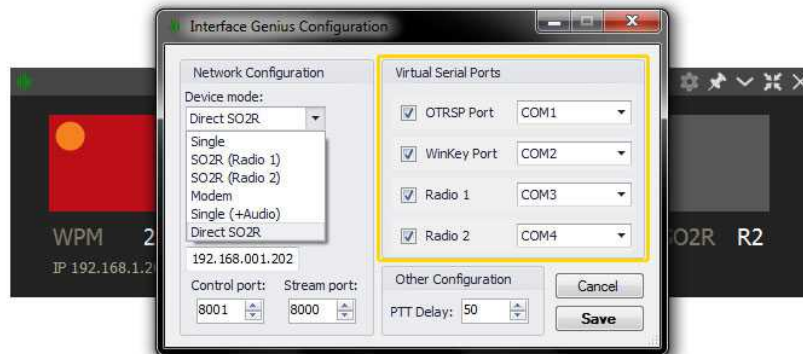You can also configure everything from the Panel software:

RIG1 settings

RIG2 Settings

Notice the Device mode and IP address difference.

Lastly, you will need to create virtual ports in the Panel software:
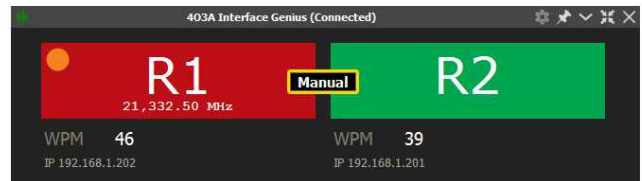

Virtual COM Ports

SO2R PROFILES

With the latest version we've implemented four different SO2R profiles:

MANUAL
OTRSP
PLAIN
HEAVY

You can switch between them by either clicking the down arrow on the device, or by clicking on the icon in the Panel software:

Click the down arrow to change profiles

Click the area marked in yellow to change profiles

MANUAL profile is changing radio RX and TX focus manually by clicking buttons on the device its self.
OTRSP profile gives control to the logging software and everything is switched automatically.
PLAIN profile is designed for a light pile up. Every time you transmit, the audio of the other radio is in both left and right channel of your headphones. Once you stop transmitting you will listen to R1 in your left headphone, and R2 in your right headphone.
**HEAVY** profile is designed for a heavy pile up. Just like in PLAIN mode, every time you transmit, the audio of the other radio is in both left and right channel of your headphones. But once you stop transmitting, R1 audio is in both headphones so you can focus on it.

CW SPEED

A new feature is different CW speeds for different radios. Use the CW pot on the device to set the CW speed of the selected radio.
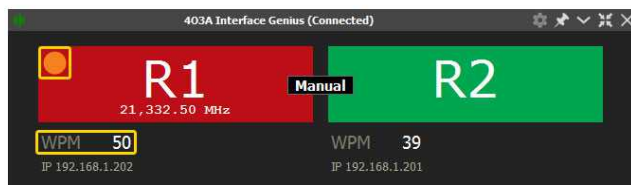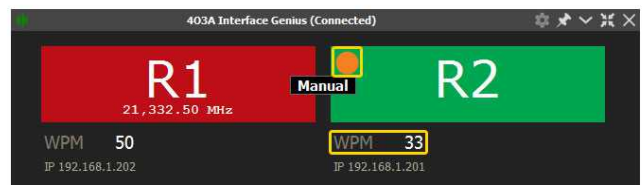

The CW speed pot
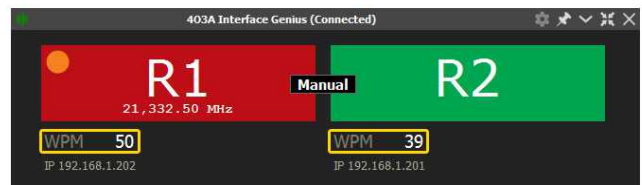
Notice the separate WPM on the two radios

What WPM you change is defined by the TX focus. On the left example, the TX focus is on R1 and moving the CW pot will change the WPM of R1. On the right example, it will be WPM of R2.

TX Focus on R1

TX Focus on R2

SINGLE MODE

Single Mode

In Single Mode you can use your IGM as a single device.

Your radio under RIG1.

CAT1 speed and settings.

After you connect your radio, frequency will be display on the main display.

A ***** symbol will let you know that IGM is communicating with the radio directly. After successfully setting up your logging software, this symbol will disappear letting you the logging software is communicating with the radio over the virtual COM port.

IGM communicating with the Radio directly

Logging software communicating with the Radio over virtual COM

IP Address of your device

Mask of your network

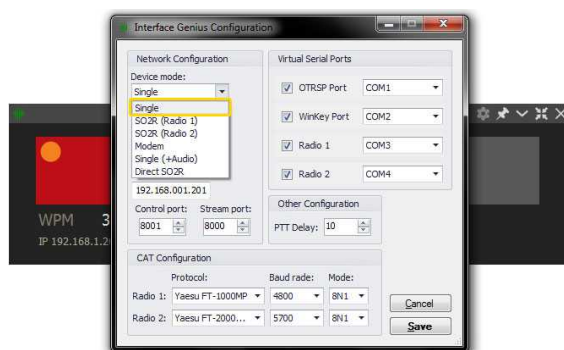*TCP Port for the Panel application should be left as default*

Broadcast port for your device should be left as default.

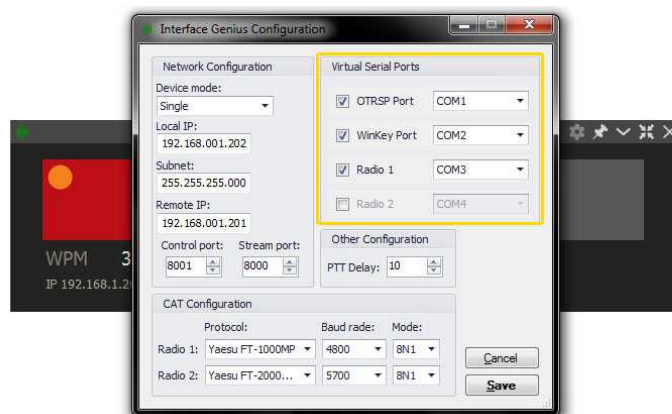Then, you can select your mode in two ways:

From the device menu

From Panel

Lastly, you will need to create virtual ports in the Panel software:
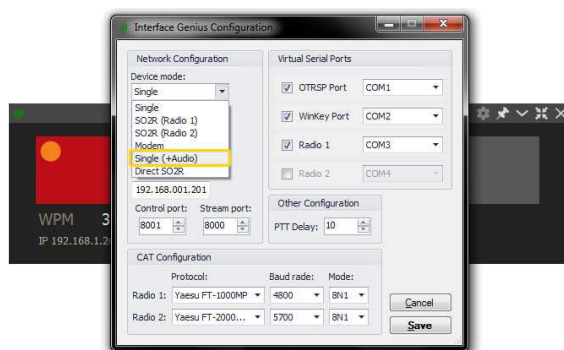

Virtual Ports

SINGLE MODE WITH AUDIO SHARE

One IGM can broadcast audio and all others can listen to it. This is useful when the In Band stations can monitor the RUN station and interfere with it as little as possible, preventing QSO loss.
To set up, configure everything as in Single mode, except the mode it self:
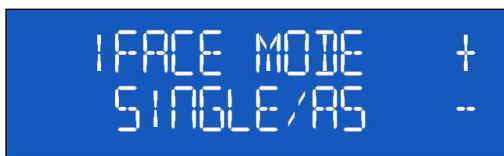
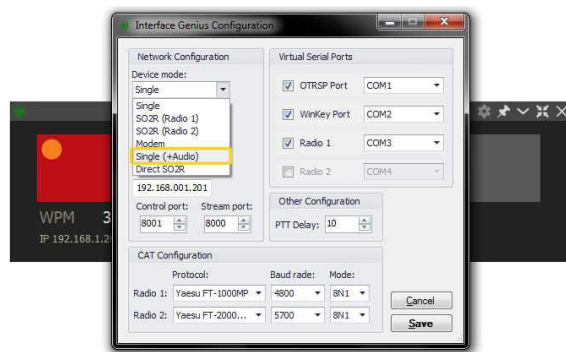*From the device menu*

From Panel

PTT DELAY

There are two PTT Delay outputs on IGM for Radio 1 and two on the SO2R extender for Radio 2. Delay time is the same for all outputs, and can be set from the Panel or the on device menu:
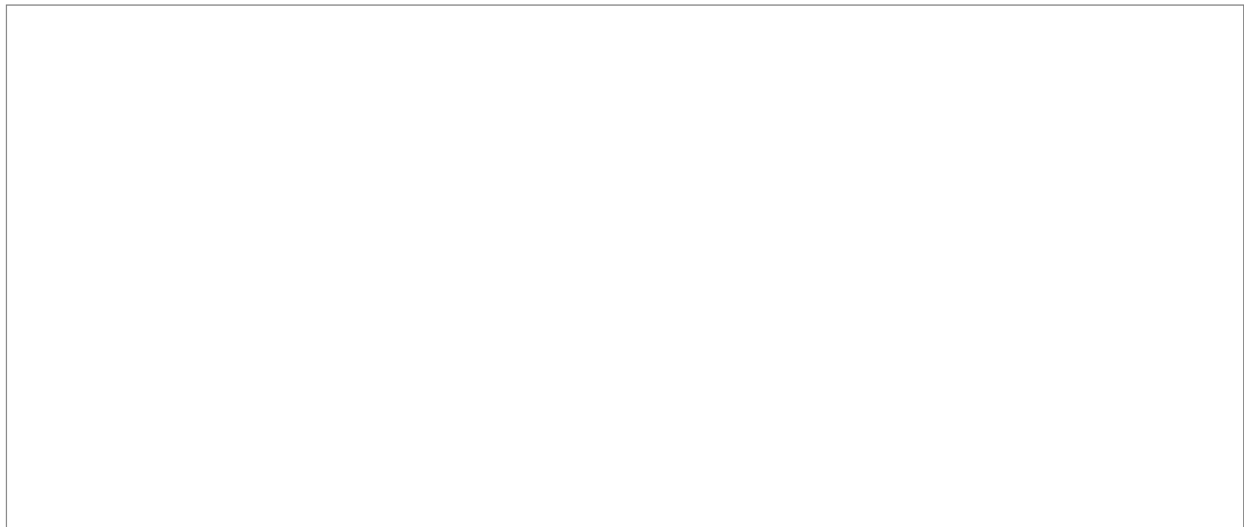

From the device menu

From Panel

MODEM MODE

Soon, you will be able to remotely control your radio over the internet. This is not supported in the current version.
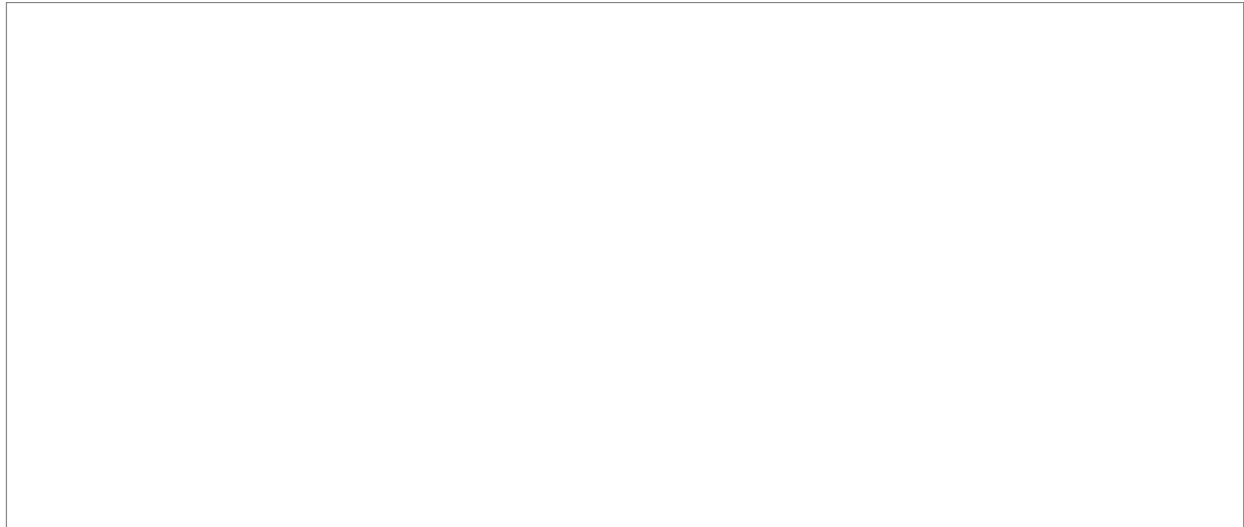

Modem Mode

IG-M is also a modem that enables remote radio control using the LAN or Internet. There is no need to rewire anything, you just press a button and it goes into the modem mode. There are two ways you can set this up.
As shown on the first picture, you can connect to your IG-M using Windows software that you can download on our webpage: www.4o3a.com
The panel on the application will mimic the front panel of your radio.

Modem Mode Slave

The twin concept is a 4O3A high end concept for serious hams who accept no compromise. Instead of using an application, you can use another radio as your interface. The control radio sends CAT commands and communicates with the remote radio.

SSB AND AUDIO

The IG-M has two separate hardware audio codes built in, making it very powerful.

CW OPERATION

IG-M comes with a built in WinKey v3.0. All its parameters are set up from the software panel. CW speed can be adjusted from the front panel as well as from software. Here is a list of WinKey features:

- 1200/9600 Baud Serial I/F
- 5 - 99 WPM
- Adjustable sidetone frequency
- Iambic A/B or Ultimatic keyer
- Autospace
- Farnsworth spacing
- Adjustable weighting
- Keying Compensation
- Dual Tune Mode
- Two output ports
- PTT out w/adjustable delay
- Standalone keyer mode
- Four message pushbuttons
- 1200/9600 Baud Serial I/F
- 5 - 99 WPM
- Adjustable sidetone frequency
- Iambic A/B or Ultimatic keyer
- Autospace
- Farnsworth spacing
- Adjustable weighting

- Keying Compensation
- Dual Tune Mode
- Two output ports
- PTT out w/adjustable delay
- Standalone keyer mode
- Four message pushbuttons
- Low power standby
- In-field firmware update
- USB support
- HSCW & QRSS Support
- Serial number generator
- Keyboard key paddle
- Custom Prosigns
- Paddle only Sidetone
- Potentiometer speed control
- 12 messages plus callsign
- Dual user support
- Supply voltage readout

UPGRADING FIRMWARE

In order to upgrade firmware, you will need version **1.1.8 Panel** software or higher. Download it from **www.4o3a.com** Download the latest firmware version as well. At the time of writing this manual, firmware version is also 1.1.8.

Connecting to the device, and open the new firmware upgrade menu as shown on the picture below.

Click the Upgrade firmware button
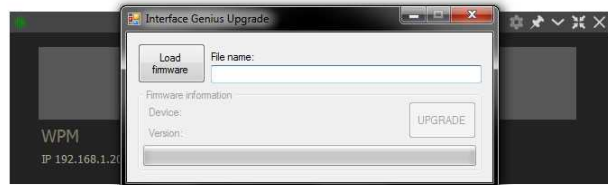
Firmware upgrade screen

Now you will need to put your device into bootloader mode. Power off your device, hold the SO2R button and then power it back again. After successfully entering the bootloader, its version should appear on the front LCD screen.
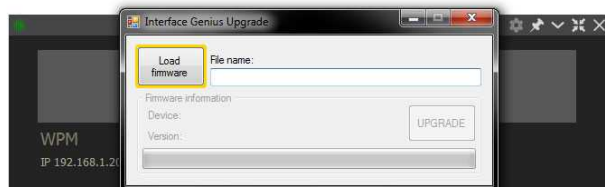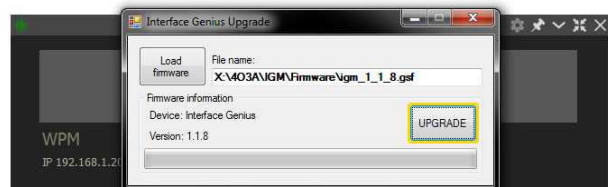

Hold the button on power up
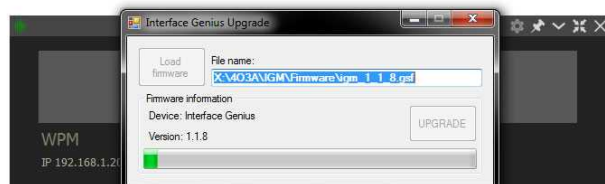

Bootloader mode

Load the firmware file you previously downloaded from our website, then click on upgrade:

Load the firmware file

Click upgrade

Wait for the progress bar to finish

Successful upgrade

After clicking OK the device will restart. Turn the device off, wait a few seconds and turn it back on. Exit the IGM Panel software, and then start it again. You should now run the latest version.

JUMPER CONFIGURATION

You can configure the PTT outputs by changing jumper positions inside the device, as shown on the picture below.
Each output can be connected to the NO (normaly open) or NC (normaly closed) relay contact.
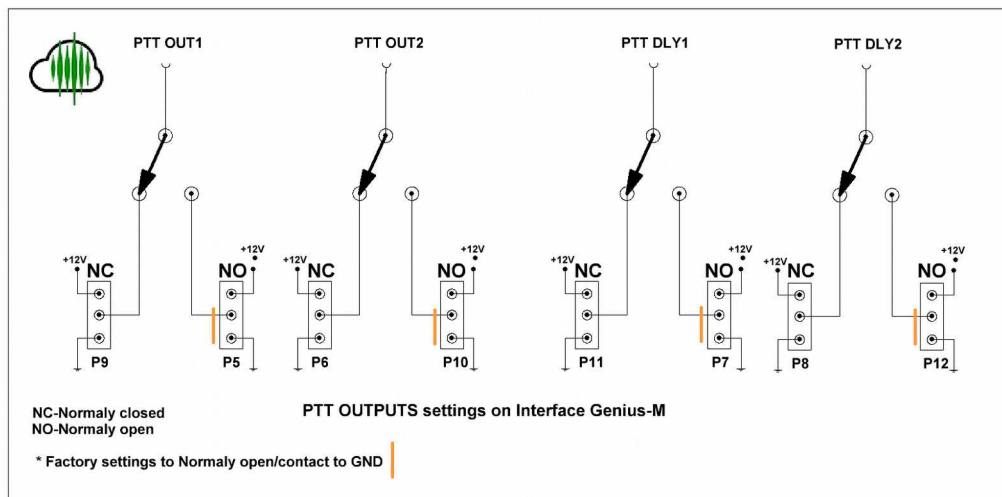 It can be set to connect to GND or +12VDC.
Most common case is NO (normaly open) contact connected to the GND. This is the factory setting, as shown on both the picture and the diagram below.
Since relays with two contacts are used, if needed, each output can be set differently.
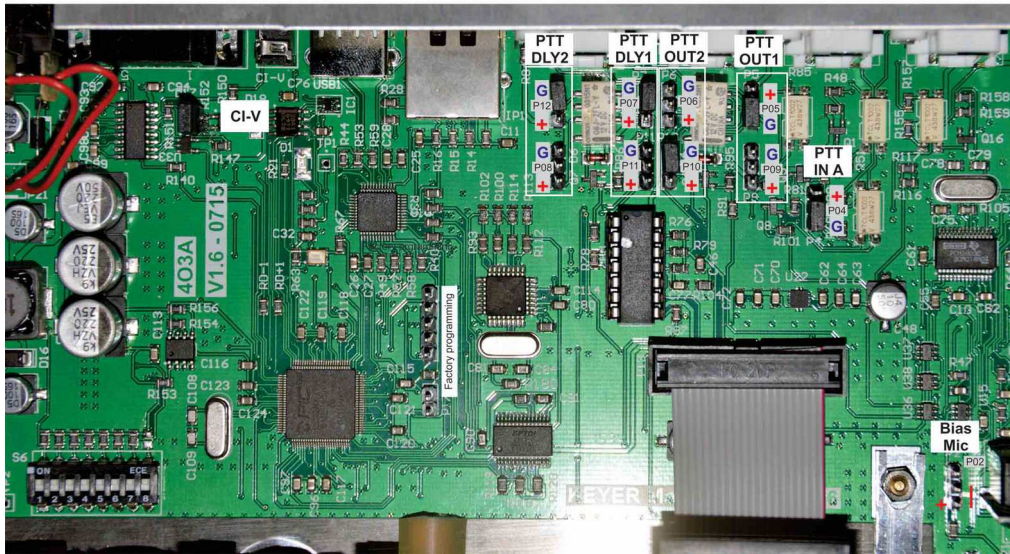
Physical jumpers

Jumper Diagram